

WHAT IS CLAIMED:

1. A seal assembly for a solid oxide fuel cell stack, comprising:

at least two fuel cell stack components having opposed surfaces; and

a seal member disposed between said surfaces, wherein said seal member is a compliant seal member that is mechanically compliant in both in-plane and out-of-plane directions relative to said surfaces.

2. The apparatus according to claim 1, wherein said seal member comprises a stable oxide ceramic.

3. The apparatus according to claim 1, wherein said seal member comprises at least one material selected from the group consisting of alumina, magnesia, zirconia, mullite, yttrium aluminum garnate, magnesium silicate and combinations thereof.

4. The apparatus of claim 1, wherein said seal member comprises an elongate compressible member having a structure selected from the group consisting of fibers, tows, yarns, woven fibers and combinations thereof.

5. The apparatus of claim 1, wherein said seal member comprises one or more substantially continuous fibers.

6. The apparatus of claim 5, wherein said fibers are impregnated with at least one metal selected from the group consisting of Ni, Cr, Ag, Cu, Fe, Al and combinations thereof.

7. The apparatus of claim 5, wherein said fibers are impregnated with at least one material selected from the group

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consisting of alumina, zirconia, yttria aluminum garnate, magnesium silicate and combinations thereof.

8. The apparatus of claim 5, wherein said fibers are impregnated with Ag_2O .

9. The apparatus of claim 5, wherein said seal member comprises at least a first fiber in a substantially concentric relationship with a second fiber.

10. The apparatus of claim 9, wherein said at least two fuel cell stack components comprise a separator plate and a fuel cell with said seal member disposed therebetween.

11. The apparatus of claim 1, further comprising a compression stop extending from at least one of said fuel cell stack components and defining thereon at least one of said opposed surfaces and having a groove for receiving said seal member.

12. The apparatus of claim 11, wherein said seal member has a height and said groove has a depth, and wherein said height is greater than said depth whereby said seal member in said groove can be compressed between said opposed surfaces.

13. A seal member for a solid oxide fuel cell stack, comprising one or more substantially continuous fibers.

14. The seal member of claim 13, wherein said seal is defined by multiple loops of said substantially continuous fibers.

15. The seal member of claim 14, wherein said at least one

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substantially continuous fiber defines said multiple loops, and wherein end portions of said substantially continuous fibers are wrapped around said multiple loops.

16. The seal member according to claim 13, wherein at least one of said substantially continuous fibers comprises a stable oxide ceramic.

17. The seal member according to claim 13, wherein at least one of said substantially continuous fibers comprises a material selected from the group consisting of alumina, zirconia, yttria aluminum garnate, magnesium silicate and combinations thereof.

18. The seal member according to claim 13, wherein at least one of said substantially continuous fibers comprises an elongate compressible member having a structure selected from the group consisting of tows, yarns, woven fibers and combinations thereof.

19. The seal member according to claim 13, wherein said seal member is impregnated with a plurality of particles.

20. The seal member according to claim 19, wherein said particles comprise at least one metal selected from the group consisting of Ni, Cr, Ag, Cu, Fe, Al and combinations thereof.

21. The seal member according to claim 13, wherein said fibers are impregnated with Ag_2O .

22. A seal assembly for a fuel cell stack, comprising:
at least two fuel cell stack components having opposed surfaces; and

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a seal member disposed between said surfaces, wherein said seal member is a compliant seal member that is mechanically compliant in both in-plane and out-of-plane directions.

23. The apparatus of claim 22, wherein said seal member comprises one or more substantially continuous fibers.

24. A seal assembly for a solid oxide fuel cell stack, comprising:

at least two fuel cell stack components having opposed surfaces;

a seal member disposed between said surfaces, wherein said seal member is a compliant seal member that is mechanically compliant in a direction substantially perpendicular to said opposed surfaces; and

a compression stop disposed between said opposed surfaces of said fuel cell stack components.

----- 25. The apparatus of claim 24, further comprising a frame situated between said opposed surfaces, wherein said frame is located adjacent one opposed surface, and wherein said compression stop is disposed on said frame. -----

26. The apparatus of claim 24, wherein said compression stop is situated to provide a limit to compression of said compliant seal member.